

Geographic range**Biogeographic realm:**

- Neotropical

Countries:

- Costa Rica
- Nicaragua

Map of records (Google Earth): Suppl. material 3

Basis of EOO and AOO: Species Distribution Model

Basis (narrative): Despite few collection sites recorded for this species, it was possible to perform species distribution modelling to predict its potential range. See methods for details.

Min Elevation/Depth (m): 0

Max Elevation/Depth (m): 1770

Range description: *Brachypelma albopilosum* can be found in northern Costa Rica (Valerio 1980) across the northern part of Province of Alajuela and into south-eastern Nicaragua throughout the Department Río San Juan and into Región Autónoma Costa Caribe Sur (Maes et al. 1989, Maes 1992, unpublished data).

Extent of occurrence

EOO (km²): 29633

Trend: Decline (inferred)

Justification for trend: A decline in EOO is inferred from habitat loss due to deforestation, urbanisation and agricultural activities.

Causes ceased?: No

Causes understood?: Yes

Causes reversible?: No

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km²): 13256

Trend: Decline (inferred)

Justification for trend: A decline in AOO is inferred from habitat loss due to deforestation, urbanisation and agricultural activities.

Causes ceased?: No

Causes understood?: Yes

Causes reversible?: No

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Justification for trend: Given the large range, the number of locations is much above that of any category thresholds.

Population

Number of individuals: Unknown

Trend: Decline (inferred)

Justification for trend: A decline in population size is inferred from possible loss of AOO and EOO due to deforestation (Global Forest Watch 2019), urbanisation and agricultural activities within its range. Additionally, the population is harvested for the pet trade in Nicaragua.

Basis for decline:

- (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
- (d) actual or potential levels of exploitation

Causes ceased?: No

Causes understood?: Yes

Causes reversible?: No

Extreme fluctuations?: Unknown

Population Information (Narrative): A decline in population size is inferred from habitat loss due to deforestation (Global Forest Watch 2019), urbanisation and agricultural activities. Additionally, the population is harvested for the pet trade in Nicaragua.

Subpopulations

Number of subpopulations: Unknown

Trend: Decline (inferred)

Justification for trend: A decline in number of subpopulations is inferred from habitat loss due to deforestation (Global Forest Watch 2019), urbanisation and agricultural activities. Additionally, the population is harvested for the pet trade in Nicaragua which might cause some subpopulations to be entirely depleted.

Justification for fragmentation: To our knowledge, the species is not subject to severe fragmentation.

Habitat

System: Terrestrial

Habitat specialist: No

Habitat (narrative): *Brachypelma albopilosum* inhabits moist tropical broadleaf forests of Central America, which have been described as “lush, tall tropical evergreen forest of huge, buttressed canopy trees reaching 40m in height and an extremely rich epiphyte flora” (Hijmensen 2018). The species can be found in an altitudinal range from 0-1770 metres (above sea level), but prefers lower altitudes and a warmer climate. It also presents some tolerance to semi-disturbed areas, for example around edges of small towns.

Trend in extent, area or quality?: Decline (inferred)

Justification for trend: The habitat of this species is inferred to be declining in area, extent and quality due to deforestation (Global Forest Watch 2019), mainly due to agricultural activities.

Habitat importance: Major Importance

Habitats:

- 1.6. Forest - Subtropical/Tropical Moist Lowland

Habitat importance: Marginal

Habitats:

- 14.2. Artificial/Terrestrial - Pastureland
- 14.6. Artificial/Terrestrial - Subtropical/Tropical Heavily Degraded Former Forest

Ecology

Size: 70 mm (female); 60 mm (male).

Generation length (yr): 7

Dependency of single sp?: No

Ecology and traits (narrative): *Brachypelma albopilosum* is largely a fossorial species that modifies previously excavated burrows or can excavate their own unaided, sometimes on minor alterations to natural small cavities under debris such as large rocks and tree roots in dense vegetation of moist tropical forest. Others, however, can be found in more clearly defined obligate burrow-like retreats under similar debris or be somewhat adaptable to disturbance and found amongst fallen wood, between rocks or even associated with cavities higher up in trees (Hijmensen 2018). Burrows can have either very little or decent amounts of silk at the burrow entrance to transmit the vibrations of prey movement (if present) and can be sealed with a further thin layer of silk across the diameter during daylight that may deter predators (e.g. ants, wasps etc.) and/or help maintain humidity inside the retreat. The burrows of adults can be steeply inclined by the entrance, but elbowed below to become more horizontal and relatively narrow throughout except for a larger terminal chamber or chambers. These spiders are nocturnal predators that wait near the entrance of their refuge from dusk and into the night to feed primarily on ground-dwelling arthropods (insects, other arachnids and some myriapods) or even small vertebrates. The mating season occurs during the rainy season (June to October) and may continue into the dry season (after December) when mature males wander in the open to search for females. The males are likely most active at night, cooler daylight hours and throughout overcast days. Adult females typically moult once per year, just prior to the onset of the annual male emergence. Females will produce cocoons (large silken egg sacs) during the driest spring months with young emerging about two months later. Most young disperse in the late spring (March-April) or summer, just before the onset of the early summer rains.

Threats

Threat type: Ongoing

Threats:

- 1.1. Residential & commercial development - Housing & urban areas
- 2.2.1. Agriculture & aquaculture - Wood & pulp plantations - Small-holder plantations
- 2.2.2. Agriculture & aquaculture - Wood & pulp plantations - Agro-industry plantations
- 2.3.2. Agriculture & aquaculture - Livestock farming & ranching - Small-holder grazing, ranching or farming
- 2.3.3. Agriculture & aquaculture - Livestock farming & ranching - Agro-industry grazing, ranching or farming

- 5.1.1. Biological resource use - Hunting & trapping terrestrial animals - Intentional use (species is the target)

Justification for threats: As for the majority of *Brachypelma* species, the reduction in habitat size due to human modification of land use is an important threat. Added to this, within just the last 5 years, *B. albopilosum* has begun to be intensely harvested from the wild in Nicaragua for the pet trade, in large part for registered exports to fill the large demand of major chain pet stores, but also to meet the illegal market.

Conservation

Conservation action type: In Place

Conservation actions:

- 1.1. Land/water protection - Site/area protection
- 3.4.1. Species management - Ex-situ conservation - Captive breeding/artificial propagation
- 5.1.1. Law & policy - Legislation - International level

Conservation action type: Needed

Conservation actions:

- 1.2. Land/water protection - Resource & habitat protection
- 3.1.1. Species management - Species management - Harvest management
- 3.1.2. Species management - Species management - Trade management
- 3.2. Species management - Species recovery
- 3.3.1. Species management - Species re-introduction - Reintroduction
- 3.4.1. Species management - Ex-situ conservation - Captive breeding/artificial propagation
- 5.3. Law & policy - Private sector standards & codes
- 5.4.1. Law & policy - Compliance and enforcement - International level
- 5.4.2. Law & policy - Compliance and enforcement - National level
- 6.3. Livelihood, economic & other incentives - Market forces
- 6.4. Livelihood, economic & other incentives - Conservation payments

Justification for conservation actions: Important conservation actions include the protection of the natural habitat of *B. albopilosum*, establishing management plans and conducting systematic monitoring to provide information for population recovery and species re-introduction programmes. Although the real occurrence of this species remains to be evaluated, some protected areas such as Refugio Nacional de La Vida Silvestre Caño Negro, Rincón de la Vieja Natural Park, Guanacaste Natural Park and Tenorio Volcano Natural Park are into the probable range of the species and may be suitable for developing conservation initiatives. In order to avoid international trade, incompatible with its survival, this species is currently listed on CITES Appendix II, along with all the other

species of the genus *Brachypelma* (CITES 2019). Breeding and trade are not allowed in Costa Rica, one of the countries where this species occurs and just a single Unit for Management (UMA) in Mexico is currently breeding and legally selling true *B. albopilosum* in the market. As *B. albopilosum* is a species with a high demand in the trade and easy to breed, legal breeding should be encouraged, as well as developing a system for certifying the origin of specimens that come from legal breeding programmes. It is necessary to develop better enforcement actions to curb illegal pet trade, as well as establish tax advantages for legal dealers, in order to make their prices more competitive with the ones in the black market.

Other

Use type: International

Use and trade:

- 13. Pets/display animals, horticulture
- 16. Establishing ex-situ production *

Justification for use and trade: Just a single Unit for Management (UMA) in Mexico is currently breeding and legally selling true *B. albopilosum* in the market. This species is currently listed on CITES Appendix II and thus its international trade is regulated by an international agreement (CITES 2019). *Brachypelma albopilosum* is a species with a recent high demand in the pet trade and its population is declining due to relatively intensive extraction for these markets. During 2006-2016, *B. albopilosum* was considered a very common species in the trade, with between 3,101–4,784 live specimens traded internationally, none of them being declared as wild-caught and most declared as being for commercial purposes (Cooper et al. 2019). Anecdotal information suggests that many of the specimens exported from Nicaragua were adult or subadult specimens, clearly indicating these would be wild-caught animals. These were seen to contain a large percentage of either pregnant females or those in breeding age, the removal of which could severely negatively impact on the ability of affected subpopulations to recover from harvesting.

Ecosystem service type: Less important

Research needed:

- 1.1. Research - Taxonomy
- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology
- 1.5. Research - Threats

Justification for research needed: Taxonomic studies are needed to clarify the status of the Honduran subpopulations. Prioritisation and support for basic research on ecology, traits, population status and distribution of the species, since there is little data about *B. albopilosum*, should also be a priority.

Brachypelma andrewi Schmidt, 1992

Species information

Synonyms: None.

Common names: None.

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Theraphosidae

Taxonomic notes: *B. andrewi* is known from a single male, supposedly from the island of Cuba (Smith 1992). However, the holotype is lost and there is no other information about the species. Mendonza and Francke (in press) are publishing a taxonomic revision of *Brachypelma* and this species will be considered a *nomen dubium*.

Region for assessment:

- Global

Geographic range

Biogeographic realm:

- Neotropical

Countries:

- Cuba

Map of records (Google Earth): Suppl. material 4

Basis of EOO and AOO: Unknown

Basis (narrative): This species EOO and AOO are unkown.

Min Elevation/Depth (m): 0

Max Elevation/Depth (m): 0

Range description: The species is known from a single male, supposedly from Cuba (Smith 1992). However, the holotype is lost and there is no other information about it.

Extent of occurrence

EOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Area of occupancy

AOO (km2): Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Locations

Number of locations: Unknown

Trend: Unknown

Extreme fluctuations?: Unknown

Justification for extreme fluctuations: The single specimen known is the holotype, thus there is no ecological data.

Population

Number of individuals: Unknown

Trend: Unknown

Causes ceased?: Unknown

Causes understood?: Unknown

Causes reversible?: Unknown

Extreme fluctuations?: Unknown

Subpopulations

Number of subpopulations: Unknown

Trend: Unknown

Extreme fluctuations?: Unknown

Severe fragmentation?: Unknown

Habitat

System: Terrestrial

Habitat specialist: Unknown

Habitat (narrative): Unknown habitat type.

Trend in extent, area or quality?: Unknown

Habitat importance: Major Importance

Habitats:

- 18. Unknown

Ecology

Size: unknown female, 55 mm (male).

Generation length (yr): 7

Dependency of single sp?: No

Ecology and traits (narrative): *Brachypelma andrewi* is only known from the male holotype and there is no information about its ecology.

Threats

Threat type: Past

Threats:

- 12. Other options - Other threat

Justification for threats: Since there is virtually no data about this species, threats are unknown.

Conservation

Conservation action type: In Place

Conservation actions:

- 5.1.1. Law & policy - Legislation - International level

Justification for conservation actions: Despite the lack of basic data, *B. andrewi* is currently listed on CITES Appendix II, along with all the other species of the genus *Brachypelma* (CITES 2019).

Other

Use type: International

Use and trade:

- 13. Pets/display animals, horticulture

Justification for use and trade: *Brachypelma andrewi* is currently listed on CITES Appendix II and thus its international trade is regulated by an international agreement (CITES 2019). According to Cooper et al. (2019), a few specimens of *B. andrewi* were traded internationally during 2006–2016 from Chile to the USA, all as live specimens for commercial purposes. Since the identity of *B. andrewi* is unclear, all these specimens traded as *B. andrewi* presumably were misidentified.

Ecosystem service type: Less important

Research needed:

- 1.1. Research - Taxonomy
- 1.2. Research - Population size, distribution & trends
- 1.3. Research - Life history & ecology

Justification for research needed: Virtually nothing is known about *B. andrewi*, including its taxonomic validity. Thus, basic research on taxonomy, ecology and distribution has to be supported as the first step to any other studies and actions.

Brachypelma auratum Schmidt, 1992

Species information

Common names: Mexican flameknee, tarántula rodillas de fuego, tarántula mexicana rodilla de llama, tarántula rodillas rojas, mygale à genoux de feu du Mexique.